

SOCIO-ECONOMIC

PLANNING SCIENCES

AN INTERNATIONAL JOURNAL

List of Contents and Author Index

Volume 22, 1988

PERGAMON PRESS

OXFORD · NEW YORK · BEIJING · FRANKFURT
SÃO PAULO · SYDNEY · TOKYO · TORONTO

EDITOR-IN-CHIEF

BARNETT R. PARKER



Socio-Economic Planning Sciences *An International Journal*

Editor-in-Chief BARNETT R. PARKER, 113 Derby Lane, Chapel Hill, NC 27514, U.S.A.

Founding Editor SUMNER N. LEVINE

Editorial Board

ALFRED BLUMSTEIN,
School of Urban and Public Affairs,
Carnegie Mellon Institute,
Pittsburgh, PA 15213

MELVILLE BRANCH,
Graduate Program of Urban and Regional Planning,
University of Southern California,
Los Angeles, CA 90024

J. R. CANADA,
Department of Industrial Engineering,
North Carolina State University,
Raleigh, NC 27607

HECTOR CORREA,
Graduate School of Public and International Affairs,
University of Pittsburgh,
Pittsburgh, PA 15260

DONALD ERLINKOTTER,
Graduate School of Management,
University of California,
Los Angeles, CA 90024

GERALD GARVEY,
Woodrow Wilson School, Princeton University,
Princeton, NJ 08540

MICHAEL R. GREENBERG,
Livingston College, Rutgers University,
New Brunswick, NJ 08903

SHIV K. GUPTA,
Operations Research Group,
Wharton School, University of Pennsylvania,
Philadelphia, PA 19104

PATRICK T. HARKER,
Department of Decision Sciences,
Wharton School, University of Pennsylvania,
Philadelphia, PA 19104

BRITTON HARRIS,
Department of Civil Engineering,
Stanford University,
Stanford, CA 94305

LESTER A. HOEL,
Department of Civil Engineering,
University of Virginia,
Charlottesville, VA 22901

RONALD A. HOWARD,
Department of Engineering-Economic Systems,
Stanford University,
Stanford, CA 94305

FRANKLIN J. JAMES,
Department of Housing and Urban Development,
Washington, DC 20410

LEE KOPPELMAN,
Long Island Regional Planning Board,
Hauppauge, NY 11788

KENNETH L. KRAEMER,
Public Policy Research Organization,
University of California,
Irvine, CA 92717

LAWRENCE D. MANN,
Department of City and Regional Planning,
Harvard University,
Cambridge, MA 02138

JOHN R. MEYER,
Kennedy School of Government,
79 Kennedy Street,
Cambridge, MA 02138

MARTIN MEYERSON,
Vannoy Library,
University of Pennsylvania,
Philadelphia, PA 19104

EDMUND D. PELLEGRINO,
Joseph and Rose Kennedy Institute of Ethics,
Georgetown University,
Washington, DC 20007

GEORGE M. RAYMOND,
Raymond, Parrish, Pine and Weiner,
Tarrytown, NY 10591

IRA ROBINSON,
Faculty of Environmental Design,
University of Calgary,
Calgary, Alberta, Canada T2N 1N4

THOMAS L. SAATY,
Graduate School of Business,
University of Pittsburgh,
Pittsburgh, PA 15260

Administrative Editor
EDYTHE A. PARKER,
113 Derby Lane,
Chapel Hill, NC 27514

Publishing Office: Pergamon Press plc, Journals Production Unit, Hennock Road, Marsh Barton, Exeter EX2 8NE, Devon, U.K. [Tel. Exeter (0392) 51558; Telex 42749].

Subscription and Advertising Offices: North America—Pergamon Press Inc., Maxwell House, Elmsford, NY 10523, U.S.A. Rest of the World—Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, U.K. [Tel. Oxford (0865) 64881].

Published 6 issues/annum. Annual Subscription Rates (1989): annual institutional subscription rate (1989) DM 430.00; 2-year institutional rate (1989/90) DM 817.00; personal subscription rate for those whose library subscribes at the regular rate (1989) DM 157.00. Prices are subject to amendment without notice.

Microform Subscriptions and Back Issues: Back issues of all previously published volumes are available direct from Pergamon Press. Back issues of Pergamon journals in microform can be obtained from: UMI, 300 North Zeeb Road, Ann Arbor, MI 48106, U.S.A.

Copyright © 1988 Pergamon Press plc

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying information for users in the U.S.A. The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for the copying beyond that permitted by Section 107 or 108 of the United States Copyright Law is paid. The appropriate remittance of \$3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

Permission for other use. The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying.

The Item-fee Code for this publication is: 0038-0121/88 \$3.00 + 0.00

List of Contents

NUMBER 1

Field Applications of Operations Research in Primary Health Care Within Developing Countries—Part II

<i>Foreword by Robert Maxwell</i>	i
<i>Editorial</i>	
Sumner N. Levine	ii
<i>A Tribute to Sumner N. Levine</i>	
Barnett R. Parker	iii
<i>Preface</i>	
Jeanne S. Newman and Barnett R. Parker	1
Optimization of task allocation for community health workers in Haiti	
Barnett R. Parker, Sally K. Stansfield, Antoine Augustin, Reginald Boulos and Jeanne S. Newman	3
Improving oral rehydration salt inventory management in rural health facilities in Egypt	
Ahmed Nagaty	15
Strategies to plan and assess alternative programs to train rural-based health workers in Papua New Guinea	
Sherilynn F. Spear, Ellen vor der Bruegge, Charles B. Hamilton and Stewart N. Blumenfeld	23
Increasing the productivity of community health workers in rural Nigeria through supervision	
E. O. Ojofeitimi, M. K. Jinadu and I. Elegbe	29
Reducing attrition among village health workers in rural Nigeria	
Herman H. Gray and James Ciroma	39
Perspectives on utility-based decision models in primary health care within developing countries	
Stewart N. Blumenfeld, Jeanne S. Newman and Barnett R. Parker	45
<i>Forthcoming Papers</i>	I

NUMBER 2

Thomas P. Vaughan and Deanna Szeto	51	The diffusion of medical practice patterns in a community hospital
Robert E. Looney	57	Socio-economic planning in an era of falling oil revenues: the case of Venezuela

- | | | |
|--|-----|--|
| Robert E. Looney | 71 | Socio-economic environments and the budgetary allocation process in developing countries: the case of defense expenditures |
| S. C. Lonergan and C. Cocklin | 83 | The use of lexicographic goal programming in economic/ecological conflict analysis |
| S. B. Sinha, K. A. Rao and B. K. Mangaraj | 93 | Fuzzy goal programming in multi-criteria decision systems: a case study in agricultural planning |
| Mohammed-Bello Yunusa | 103 | Reconnaissance study of socio-economic base of street trading in Samaru |
| Announcement | I | Impact Forecasting: Methods, Results, Experiences. Leiden, The Netherlands, 16-17 June 1988 |

NUMBER 3

- | | | |
|---|-----|--|
| Robert E. Looney | 109 | Saudi Arabia's fiscal options: 1986-1992 |
| Malcolm B. Coate | 125 | Competition with differentiated products: a simulation analysis |
| Parviz Amir Koushki | 131 | The effect of socio-economic development on household travel behavior in Saudi Arabia |
| Joanna R. Baker and Robert T. Sumichrast | 137 | A long-range planning model for large capital expenditures: an application to ambulance allocation |
| John G. Cross | 145 | Quality/capacity substitution in the delivery of mental health care |

NUMBER 4

- | | | |
|---|-----|--|
| Robert E. Kohn | 153 | Efficiency in abatement and avoidance |
| Reuben R. McDaniel, Robert S. Sullivan and James R. Wilson | 157 | A simulation model for welfare policy analysis |
| Subhash C. Ray | 167 | Data envelopment analysis, nondiscretionary inputs and efficiency: an alternative interpretation |
| Catherine G. McLaughlin | 177 | Measuring small area variation in hospital use: site-of-care versus patient origin data |

NUMBER 5

M. Liotine and K. D. Lawrence	185	An analytical investigation of policy effects on transit system performance measurement
Aliza Fleischer, Hovav Talpaz and Daniel Freeman	195	An optimal quadratic equilibrium model based on Israel's multiregional input-output tables
Jean-Michel Guldmann	201	Land use, market mix, and the allocation of the investment costs of electricity distribution networks
Roger J. Volkema	213	Problem statements in managerial problem solving
Peter V. Schaeffer	221	Family migration in an uncertain environment
Hokey Min	229	Three-phase hierarchical allocation of university resources via interactive fuzzy goal programming

NUMBER 6

Kingsley E. Haynes, David H. Good and Tony Dignan	241	Discrete spatial choice and the axiom of independence from irrelevant alternatives
Taesik Ahn, Abraham Charnes and William W. Cooper	253	Efficiency characterizations in different DEA models
Taesik Ahn, Abraham Charnes and William W. Cooper	259	Some statistical and DEA evaluations of relative efficiencies of public and private institutions of higher learning
Michael E. Gleeson	271	The expected life of mobile homes
S. Nuri Erbas	277	The effects of inflationary finance on tax revenue under progressive tax regimes: an application to Turkey, 1963-1982
<i>About the Authors</i>	287	

